

VITAL SIGNS

MICHIGAN

Business leaders in Michigan cannot find the science, technology, engineering and mathematics (STEM) talent they need to stay competitive. Students' lagging performance in K-12 is a critical reason why. The good news is that the nation's most effective STEM education programs can help turn the tide.

Yet there is much work to do. Students have made little progress in math since 2003, and racial achievement gaps loom large. As it stands, not enough students--least of all minorities--have the chance to learn rich and challenging content that prepares them for college and careers, and math and science teachers say they lack the resources to succeed.

MICHIGAN NEEDS MORE STEM TALENT

STEM fields are growing in Michigan

Between 2017 and 2027:

STEM jobs will grow

Non-STEM jobs will grow

10%

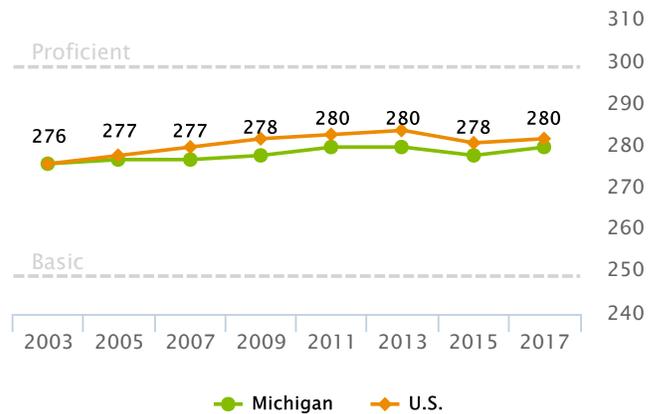
5%

THE MICHIGAN STEM SKILLS SHORTAGE STARTS EARLY

Performance in math has been flat

Michigan has made minimal progress in K-12 math.

Trends in 8th grade math scores, 2003-2017

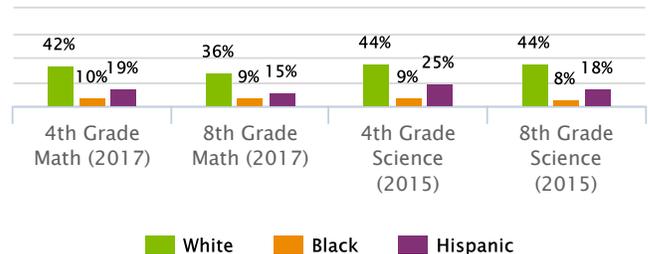


SOURCE: U.S. Department of Education, 2003-2017

Students of color lag farthest behind

Closing achievement gaps must remain a priority.

Percentage of Michigan students at or above proficient, by race/ethnicity



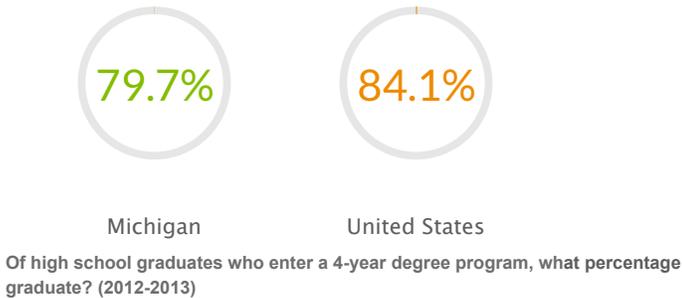
SOURCE: U.S. Department of Education, 2015-2017

*Data not available or reporting requirements not met.

The state must plug the gaps in the STEM pipeline

The Michigan STEM pipeline loses young people at every level of the education system. Low graduation rates from high school and college narrow the pipeline of students who can gain advanced STEM skills. Of those students who do graduate, few get a post-secondary degree in STEM.

What percentage of high school students graduate? (2014-2015)



What percentage of certificates and degrees is in STEM fields? (2014-2015)

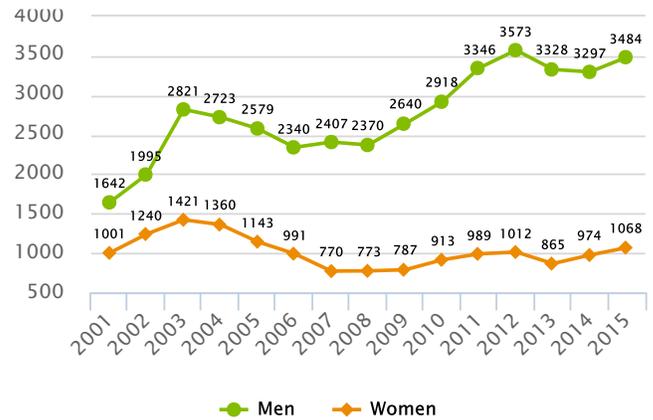
TAP MICHIGAN'S FEMALE AND MINORITY TALENT

Together, females and minorities make up more than half of Michigan's population, yet they are much less likely to earn STEM degrees or become STEM professionals. Closing these gaps can pay big dividends in the state.

Women have lost ground in computing

The available talent in computer science would rise dramatically if the state simply closed the gender gap in these subjects.

Number of computing degrees/certificates in Michigan

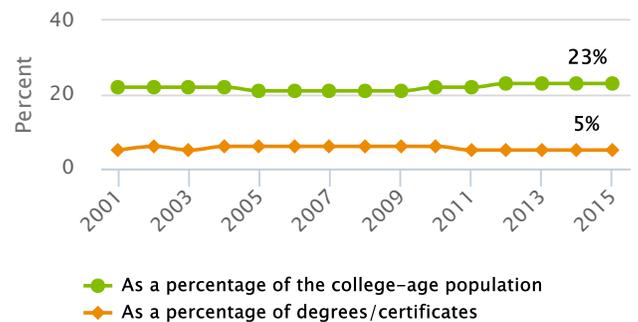


SOURCE: U.S. Department of Education, 2001-2015

People of color are not gaining ground in engineering degrees

It is critical to prepare and inspire many more students of color to pursue STEM subjects such as computer science and engineering.

Underrepresented minorities in Michigan earning engineering degrees/certificates



SOURCE: U.S. Department of Education, 2001-2015

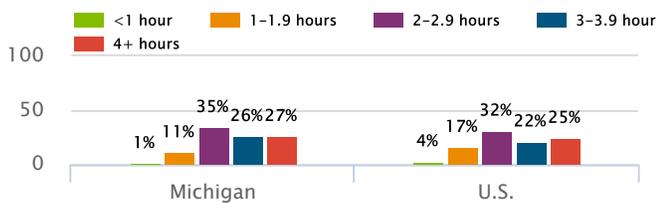
*Data not available or reporting requirements not met.

GIVE MICHIGAN STUDENTS ACCESS TO BETTER STEM LEARNING OPPORTUNITIES

Lack of access to such opportunities severely limits young people's college and career prospects.

The state should make time for elementary science

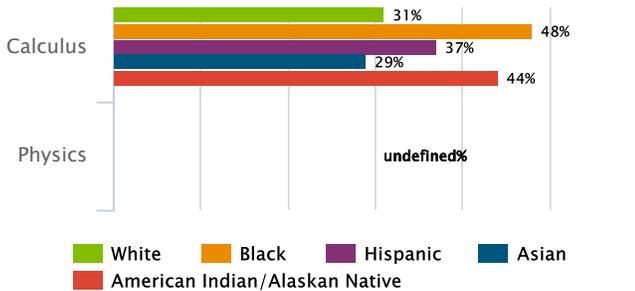
Hours per week spent on science, grades 1-4, 2015



The state should improve access to advanced courses

Many students lack access to such courses.

Students in Michigan high schools that do not offer challenging math and science courses, 2013/14



Success in Advanced Placement courses can put more students on a path to STEM careers.

Of the high school graduating class of 2015 in Michigan:

	Took AP Math Exam	Scored 3+ on AP Math Exam
All Students	12%	7%
White	12%	8%
Black	3%	1%
Hispanic	9%	4%
Asian	42%	31%
American Indian/Alaskan Native	6%	3%

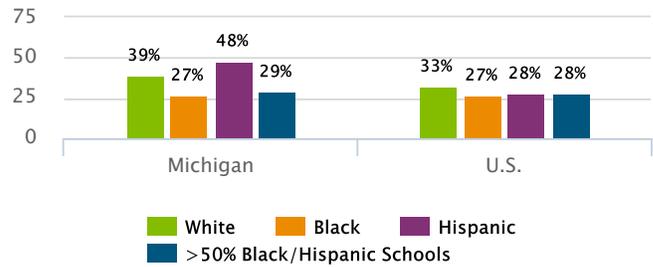


DEVELOP AND RETAIN TALENTED STEM TEACHERS IN MICHIGAN

Research shows that teachers' content knowledge and teaching experience can affect student performance

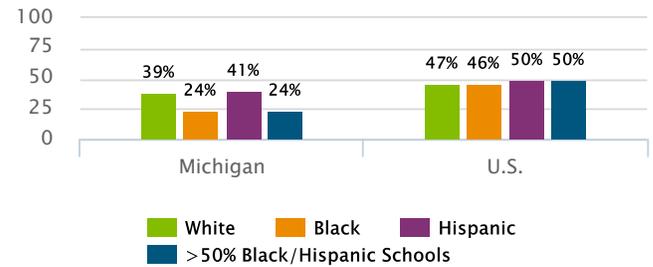
Boost teachers' content knowledge

Eighth-graders whose math teachers have an undergraduate major in math, 2017



SOURCE: U.S. Department of Education 2017

Eighth-graders whose science teachers have an undergraduate major in science, 2015

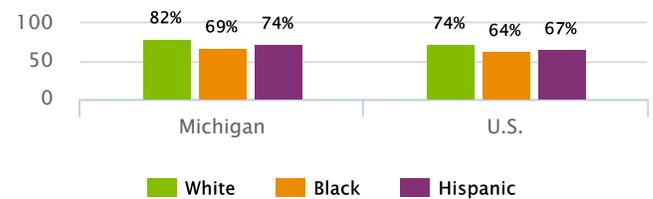


SOURCE: U.S. Department of Education 2015

Retain excellent teachers

Research shows that new teachers are less effective than teachers with three to five years of experience.

Eighth-graders whose math teachers have 6+ years of experience teaching their subject



SOURCE: U.S. Department of Education 2017

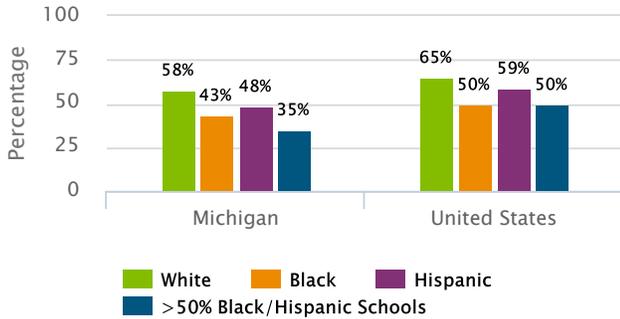
*Data not available or reporting requirements not met.

GIVE MICHIGAN SCHOOLS AND TEACHERS THE RESOURCES THEY NEED

Teachers in Michigan need better resources and teaching materials to succeed.

Too many teachers lack the tools of their trade

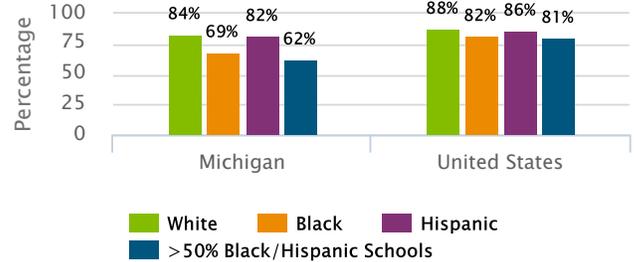
Eighth-graders whose science teachers say they have all or most of the resources they need, 2015



SOURCE: U.S. Department of Education, 2015

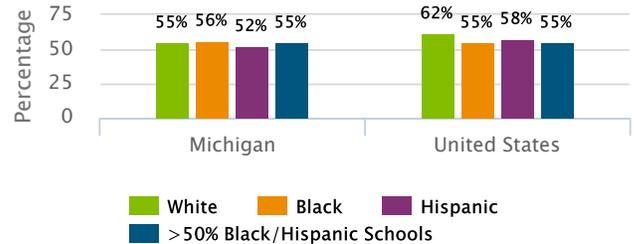
The state should improve access to science facilities and supplies

Eighth-graders whose schools have science labs, 2015



SOURCE: U.S. Department of Education, 2015

Eighth-graders whose schools report that supplies or materials for science labs are available "to a large extent," 2015



SOURCE: U.S. Department of Education, 2015

*Data not available or reporting requirements not met.

For the complete state report, methodology, and sources, see vitalsigns.ecs.org (vitalsigns.ecs.org)

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